THE VETERINARY RECORD

A Weekly Journal for the Profession.

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

No. 1401. MAY 15, 1915. VOL. XXVII.

WOUNDS IN COAL MINES.

Why should wounds generally heal more satisfactorily, and suppuration and tetanus be less frequent, in coal mines than upon the surface? There seems to be little doubt that such is the fact, whatever the explanation may be. At the interesting discussion on pit practice by the North Midland V.M.A., several members emphasised the peculiarly satisfactory results of wound treatment in pits, and none dissented. Nearly all the speakers were men engaged in pit practice; so we have here what practically amounts to an unanimous verdict of specialists.

Isolated utterances to the same effect have been heard before. A few years ago, for instance, in a discussion on poll-evil by the Central V.S., one member who had practised in coal mines drew attention to the great rarity of poll-evil there, compared with the frequency of injuries to the poll. Exactly the same point was brought out by one of the members of the North Midland Association; and perhaps poll-evil forms the most striking example of the difference in course between wounds in the pit and those in the open air.

Probably the explanation lies in the bacteriological conditions of coal mines. This is a subject not yet dealt with by veterinary text books; but there should be some information available regarding it, which colliery veterinary surgeons might well acquire. It may be thought that the subject is of little practical importance—that, as wounds generally do well in coal mines, it is of no great moment why they do so. But, if the cause were understood, it might conceivably suggest methods of treatment leading to even better results.

THE ADVANCE OF THE MOTOR.

Commercial motors of all sizes, from the light tradesman's vehicle to the heavy lorry, have become much more numerous during the last few months. We all know that the war is responsible for much of this increase. But the commercial motor had already become a formidable rival to the horse before the war; and that fact renders it unlikely that the horse will succeed in regaining the ground he has lost. It is as well to face an unpleasant truth, and admit that many of the equine patients the war took away from us will never be replaced—that their positions have been permanently filled by motors. This is a serious loss to many practitioners; but it is an even more serious question to the State.

THE ELECTION TO COUNCIL R.C.V.S.

This year the nominations equal the number of vacancies—eight. As a consequence no ballot is necessary, and the result is the re-election of the members who were retired by rotation. The names are;—

S. Stockman,	J. Mc Call,
A. E. Mettam,	O. C. Bradley
W. F. Barrett,	J. Dunstan,
A. Lawson,	S. Wharam.

Considering the number of men who are serving with the Army Veterinary Corps, and that many others are employed in Government work, it is perhaps as well that it is so. The three principals of Veterinary Colleges and the Chief Veterinary Officer at the Board of Agriculture would be re-elected in ordinary course, and it is not likely that either of the other four would be unseated without more urgent reason than present conditions would justify. Further, there will result a small saving to the funds of the College.

A THEORY OF THE ETIOLOGY OF MILK FEVER.

M. Kreutzer, of Murnau, published in 1910 a long article upon this subject (*Münch. Tier Woch*). He is an adherent of the so-called "fluxion theory"; but he introduces one important modification into it. He places the seat of the circulatory disturbances, not in the blood vessels, but in the lymphatic system. According to him, the starting-point of milk fever is in the lymphatic vessels of the udder.

The bovine udder is very rich in lymphatic vessels, which develop a lively activity at the time of lactation. The greater the quantity of milk which is produced, the greater also is the quantity of lymph in the udder, for the lymph vessels possess a very considerable capacity for absorption. A great quantity of lymph is thus conducted from the udder to the thoracic duct. The thoracic duct is forced to react to this unaccustomed quantity of lymph by a maximum dilatation of the lumen and by rapidly passing on the lymph. The accessory vessels are thus subjected to a forcible damming back at their openings into the thoracic duct, and this process runs backward along the vessels even to their sources. In consequence of the pressure which arises in this manner, the activity of sensory nerves is suspended, and the muscles supplied by impaired motor nerves lose their function. Paresis thus sets in.

Kreutzer offers an explanation for every one of the chief symptoms of milk fever. The pressure upon the sympatheticus and vagus causes the digestive disturbances. The stasis of the lymph in

the spinal cord and the pressure on the lumbar and sacral nerves cause paralysis of the hind quarters; and the stasis of lymph in the vessels of the thorax and neck disturb the functions of the brachial plexus. Thus the animal becomes unable to stand. The persistent stasis of the cervical lymph vessels extends to the lymph vessels of the head and causes loss of consciousness. The heart, in consequence of the unaccustomed amount of blood and lymph brought to it by the anterior vena cava, is stimulated to increased activity; and thus the pulse-rate is raised. The impairment of the vagus causes diminution in the number of respirations. The recurrent nerve is altered by the cervical lymphatic pressure, the vocal cords are no longer sufficiently tense, and this causes the characteristic breathing sounds heard in milk fever.

In Kreutzer's view, the post-mortem lesions of milk fever form a typical picture of stasis.

If the cause of the stasis—the formation of lymph in the udder—is removed, the whole clinical picture is brought to an end. No lesions of any kind have taken place in the nerves; but their power of transmissibility has simply been suspended by the stasis-pressure. This explains the rapid recovery without any period of convalescence.—(*Berliner Tier. Woch.*)

Observations on Bovine Udder Diseases.

Throughout the year 1910, the veterinary inspector at the abattoir of Elbing systematically tabulated all the bovine udder diseases he observed, and has published the results. In the course of the year, 1755 cows were slaughtered at the abattoir. Of these 83 (or 4.73 %) showed diseases of the udder. One quarter of the udder only was affected in eleven cases, two quarters in 25 cases, and in 47 cases the whole udder was diseased. The number of tuberculous udder cases amounted to 24, equalling 28.92 % of all udder affections. In fourteen of these tuberculous cases, the supra-mammary glands were alone affected, while in the other ten cases tuberculous lesions were found in the parenchyma. In two cases, in addition to mammary tuberculosis, pulmonary tuberculosis was also found. The most severe tuberculous alterations of the parenchyma of the udder were shown by three old cows—one aged twelve years, and the other two each about fifteen years.

Thirty-four cases, that is 40.96 % of all the udder affections—were of a suppurative character. In eleven of these cases, large abscesses were present. —(*Berliner Tier Woch.*) W. R. C.

NORTH MIDLAND VETERINARY MEDICAL ASSOCIATION.

[National V.M.A. Northern Branch].

The Quarterly Meeting was held in the Grand Hotel, Sheffield, on Tuesday, April 20th.

There were present:—Messrs. M. Robinson (President), H. Thompson (Hon. Treasurer), J. S. Lloyd (Hon. Secretary), F. L. Somerset, C. S. Smith, S. E. Sampson, H. P. Lewis, W. Collinson, G. Green, S. H. Nixon, G. J. Furness, T. C. Fletcher, A. D. Morgan, W. Murgatroyd, and J. A. Hodgman.

On the motion of Mr. F. L. Somerset, seconded by Mr. C. S. Smith, the Minutes of the last Quarterly Meeting were taken as read and confirmed.

The Report of the Council Meeting held on March 30 was adopted, on the proposition of Mr. S. E. Sampson.

A letter was read from Mr. Gray with regard to the Hunting Memorial Fund.

On the proposition of Mr. Somerset, seconded by Mr. Smith, it was resolved that the Association subscribe a sum of £5 5s. to the Hunting Memorial Fund.

The Hon. Secretary read a letter from Mr. Slocock, with regard to the Victoria Veterinary Benevolent Fund, and after some discussion he was instructed to write, drawing attention to the sound financial position of the National Veterinary Benevolent Fund, and suggesting that if cases arose with which the Council controlling the Victoria Benevolent Fund were unable to deal, they should refer the cases to the Secretary of the National Benevolent Fund with a recommendation that they should deal with them.

The Hon. Secretary read a letter received from Mr. Arthur C. Holl, of the Eastern Counties Veterinary Society, asking that the North Midland Association would support the following resolution:—

"That, in view of the great scarcity of veterinary surgeons, the time has arrived to encourage the graduation of practical men; and that this can only be obtained by the compulsory pupilage of students for at least twelve months with a qualified veterinary surgeon, prior to being admitted as a student at any of the Veterinary Colleges. That this Resolution be sent to all the Veterinary Societies, and to the Council of the College."

On the motion of Mr. Lloyd, seconded by Mr. Sampson, it was resolved that the resolution be supported by the North Midland Veterinary Association.

Apologies for inability to be present at the meeting were received from Messrs. H. Nixon, Wheatcroft, Ludlow, and Marrison.

Mr. J. Clarkson (Garforth) was, on the motion of the President, seconded by Mr. Somerset, unanimously elected a member of the Association.

"Some Observations on Accidents to Pit Ponies." "Diseases met with amongst Pit Ponies."

The President then called upon Mr. W. Collinson (Anston) to re-open the discussion on the papers read at the last Quarterly Meeting by Mr. F. L. Somerset, F.R.C.V.S., Chesterfield, and Mr. C. Secker Smith, M.R.C.V.S., Barnsley.

Mr. Collinson spoke with regard to the two caps which were exhibited by Mr. Somerset at the previous meeting, and said that one objection to them was the cost—they necessitated cutting into a large amount of leather. He went on to say most collieries get a fair amount of laminitis. In one colliery I know they get a fair amount, possibly because they use a lot of Indian buck; also the collieries are very deep, and consequently they are very hot. We have had several cases of rupture of the diaphragm in pit ponies, and in most cases it has been in the new ponies. The usual thing you get is that the lad at first says he knows nothing at all, but on being threatened with legal proceedings he says that the pony was working all right, and that he slipped on the metals and died. I have never had a case of tetanus in a colliery.

I have also been very much surprised at the marvellous way in which wounds which may be described as very serious seem to dry up and heal, without even bringing the ponies to the surface. Gathered nails also seem to heal up very well in the pit, whereas if you get a gathered nail on the surface it seems to be weeks before it recovers.

Mr. G. J. FURNESS said, I had no intention of troubling you with my remarks, as after carefully reading through the papers I found there was nothing I could say. It is wonderful the few cases of poll evil you get, considering the number of injuries there are to the poll. Strangely enough, I have had two or three cases of tetanus in one pit, but I find that it is far less common in pits than on the surface. I think if you get a fairly free drainage of wounds you can leave the ponies safely to the horsekeeper. I was very much interested to read the papers, and am sure neither of them could have been prepared without considerable trouble.

Mr. J. S. LLOYD said, I personally have had no experience of pit practice, but I think it would probably help us if some gentleman who has had experience of anti-tetanic serum could give us his experience.

Mr. G. J. FURNESS: With regard to anti-tetanic serum, I think if the case is a sub-acute one, and you get at it sufficiently early, there is a good chance of effecting a cure. I had two horses of my own attacked by tetanus. One after tumbling down developed tetanus. We got her into slings at the start, gave her plenty of serum, and she recovered. The jaws were so firmly fixed that she took no food for days. I think we fed her on sugar and water. Another pony was in the field and he picked up a bone into his frog. He was bad for some days, but got better.

Mr. F. L. SOMERSET: My remarks will be chiefly directed to criticism with regard to matters mentioned by Mr. Smith in his paper. There is one thing upon which I should like to hear an expression of opinion from you gentlemen, that is with regard to colic. I am of opinion that atmospheric conditions have something to do with colic. I very rarely get an isolated case. I have had as many as four or five in a day, and the food and water conditions being different in every case it has occurred to me that there must be something to account for a number of cases occurring within so short a period of time, and I have come to the conclusion that atmospheric conditions have something to do with it.

Mr. Smith said that he had not had many cases of calculi in pit ponies. I have had a lot, particularly in one pit. There was such a large number of cases that they had the water analysed and found there was a lot of lime in it, and we attributed the cases to the hard water. In consequence water was "piped" down to the pit. The majority of these ponies were very advanced in age. They use nothing but Welsh ponies, and they are well looked after. There are ponies working there which are over twenty years of age. The older a pony gets the more likely he is to have a calculus. In several cases calculus was diagnosed before death. Mr. Somerset described one case which was kept under treament for a week, but which was killed on the instructions of the owners, who said they would not have the animal subjected to pain any longer. He said, "I also had a case in a hunter. He was a very valuable horse, and the owner said he would like everything to be done that could possibly be done to aid the animal's recovery. This horse passed calculi. The first one smashed to bits and the second one came in a lot of dung, and it was followed by a large number of small calculi. The animal recovered.

Emphysema is largely due to coal dust. The roads are watered as required by the regulations of the Board of Trade, but there is a lot of dust on the roads, which causes a chronic cough, and emphysema follows.

Laminitis: I constantly have to condemn ponies whose soles have come down. They work and work until the soles are quite down. This occurs more in foreign ponies than in English. They seem to be very liable to chronic laminitis, which is not severe enough to stop them from working. When the last coal strike was on, I think the weather was not suitable for "turning out." It was cold weather, and as you are aware the ponies are clipped, and the pits I have to do with have not grass for the ponies to go out to. In the first month we had a number of cases of laminitis. I had given instructions for the ponies to be exercised on the roads. The owners pooh-poohed the idea, and said that they could not pay men to exercise ponies, with a consequence that they had a large number of cases of laminitis.

Pleurisy and pneumonia are very uncommon, probably attributable to the good ventilation. Ponies are, however, liable to catch cold if their tails are clipped, and the roads are draughty. I have given instructions for this practice to be stopped.

I once had a peculiar case of lockjaw. There was a batch of ponies bought in Wales. When they were unloaded one was found in a peculiar condition—he was sweating, and they had great difficulty to get him out. I was sent for, and found he had lockjaw. In four days he had recovered. It was as clear a case as I have ever seen. I have tried serum treatment, and the only case in which I should say I have given it a really fair trial the animal recovered. The same owner later on had another animal which had lockjaw, which was not so valuable as the first one. We did not use serum but the animal recovered. If you catch the case in good time, in my opinion the chloral hydrate treatment is often very successful.

Mr. Smith said in his paper he did not often see cases of cataract. I have seen a good many, and I think that the majority of cases of blindness which are not due to direct injury are due to cataract.

Mr. M. ROBINSON (President): I was up north some years ago for the purpose of buying ponies. There were two or three which had every appearance of tetanus. The dealer said that there were two or three such cases amongst every batch after being carried by rail, and that they always recovered in a day or two. The condition was probably due to fright.

Mr. C. SECKER SMITH: In regard to Mr. Somerset's paper, I have just been asking him if he has ever come across cases where pit ponies have been caught between tubs, with the result that on one side the ribs have been pressed in. I have at the present time two cases where there is a distinct hollow for about five or six of the ribs, and in both cases the ponies have been working for over twelve months, and we have never had any complaints with regard to the working of these ponies. One would naturally think from the conditions we had a case of greenstick fracture, but, on the other hand, one would naturally expect to have some lung trouble, because there is bound to be a certain amount of pressure on the lungs. I think, with regard to this case, I may be in the future able to bring before you some interesting facts. In both cases the horsekeeper made enquiry of the lads who had been driving, and was told that the ponies had been jammed between two corves.

I believe I mentioned in my paper I had come across two cases of calculus. Since our last meeting I have come across another one, which certainly was very remarkable. I went down the pit to see a pony that was lame, and found him in a tub dead. I asked the horsekeeper what was wrong. He said that the previous afternoon the pony showed signs of pain. He was given a colic draught, and in half-an-hour he appeared to be all right. In the morning the pony again appeared to be all right, but very soon he again showed signs of pain. The horsekeeper went to fetch him another colic draught, and, as he was bringing it, the pony dropped dead. This pony had been in the pit for eight years, and one would naturally think that some time or other he would have shown some signs of the calculus, which weighed ¾lb.

Gentlemen, I thank you for the way in which you received my paper.

Mr. T. C. FLETCHER (Sheffield): I must apologise for being late. I am sorry I was not here for the discussion on the two papers. I have brought with me a bridle—

the bridle which was here last time It is the invention of a brother of mine at Wrexham, and, Gentlemen, I should like you to look at it and give me an opinion on it. It is one which my brother pins very great faith to, in preference to the one which is in use in this district—the one with the leather guard. He contends that with this bridle it is impossible to bend the wires so that they affect the pony's eyes, or in any way injure the pony's eyes. The guards are made of malleable iron, which may be bent, but is not readily broken. His great standpoint in favour of the bridle is the large amount of protection it gives to the toppin, and in a letter to me which he wrote after seeing remarks made about it in *The Record*, he says, "If anyone can break this guard by fair means, or use in the pit, I will provide another free of cost." Another good point about the bridle is that it can be adjusted to fit a horse with an injured eye, and assist the methods of treatment. I myself have no colliery practice, and I have no colliery experience, but I have seen several pit-pony bridles. My brother says that a pony in a pit must see behind it, and he contends that with this particular bridle a pony can see behind it. There are some gentlemen here who have had great experience with pit ponies, and I should like their criticism of this particular bridle.

Mr. F. L. SOMERSET: My remarks with regard to bridles in which the protection for the eye was by means of metal were directed more particularly to a bridle in which there is a ring with radiated pieces of metal from the centre. This arrangement of Mr. Fletcher's is new to me, and is very much better I can see without having the thing actually in use than the ring form. It has the advantage, as Mr. Fletcher points out, of enabling the pony to see not only in front, but at the sides and at the back. It is not so necessary that a pony should be able to see except in front. The roads are narrow, and it is necessary that he should see the obstruction before him. Another advantage in Mr. Fletcher's bridle is its comparative lightness. I shall probably obtain one or more of these bridles, and give them a trial, and if they compare favourably in wear and cost with those we have used before, we shall problably use a good number of them.

Mr. COLLINSON said that the leather caps very soon wear thin, and it is probable that Mr. Fletcher's would do so.

Mr. T. C. FLETCHER pointed out that the malleable iron bars could be removed and new ones substituted.

The PRESIDENT moved that the best thanks of the Association be given to Mr. Somerset and to Mr. Smith for their excellent papers. He said that both gentlemen had had great experience of colliery practice, and that no doubt their papers had taken a good deal of time and trouble to prepare. He said, speaking of tetanus, I have had several cases to deal with, but I have never had any good results from anti-tetanic serum, either in pit ponies or in ordinary practice.

The HON. SECRETARY, in seconding the vote of thanks, which was carried with acclamation, spoke of an interesting case of calculus.

THE VALUE OF VETERINARY INSPECTION IN THE DETECTION OF TUBERCULAR MASTITIS.

Mr. A. D. MORGAN, M.R.C.V.S, Sheffield.

Mr. President and Gentlemen.—Some time ago Mr. Lloyd asked me if I would read a paper before the Society. Without, perhaps, fully weighing the consequences, I said I would—some time in the future—with the result that I am now about to make the attempt.

I have chosen for my subject, "The value of Veterinary Inspection in the detection of Tubercular Mastitis;" firstly, because a considerable part of my time is devoted to the inspection of cows' udders with the object of detecting or endeavouring to detect tubercular mastitis; secondly, because I think that the subject is one in which most of the members of this Society are interested—especially so as the Tuberculosis Order is likely to be re-introduced before the end of the present year.

It goes without saying that it is a very desirable and proper thing that every attempt should be made by local authorities to discover cases of tuberculosis of the udder in dairy herds kept in their administrative areas. From the point of view of the members of our profession, it is still more desirable that those attempts should be made in a practical way, namely, by employing veterinary surgeons to carry out the duties of inspectors of dairy cattle. It is quite probable that a considerable percentage of cases of tuberculosis of the udder may be and are discovered by lay inspectors, where those inspectors have some acquaintance with cows' udders, and some idea of what a normal udder should be like. Some measure of success, I concede, may attend the efforts of those inspectors if they adopt the simple expedient of taking samples from every udder or quarter of the udder which, in their opinion, is abnormal, and submitting it for bacteriological examination. The objections to this system are:—

(1) The lay inspector will probably pass many abnormal udders through not recognising the abnormalities.

(2) He will almost certainly sample all those udders showing the grossest abnormalities, and so get a great many samples which are not tuberculous, for tuberculous udders do not in the majority of cases present the very grossest lesions. For instance, "Acute Parenchymatous Mastitis"—where there is invasion by streptococci and stephylococci—may produce an exceedingly gross lession of the udder.

(3) The system is an expensive one, for too many samples are taken, and almost every one goes through tbe "biological test."

Later on I shall endeavour to show you by means of figures that it is to the advantage of local authorities—and so to the general public—that veterinary surgeons should be selected to act as inspectors of milking stock. Meanwhile, I propose to tell you briefly the method I myself employ when examining cows' udders for the possible presence of tubercular mastitis. Then I propose to mention some of the chief abnormalities met with in cows' udders.

In Sheffield, we examine all the cows kept within the city boundary at regular periods. We aim at visiting each farm or cow-keeper's premises every two months. At present, owing to the fact that one of our staff (Mr. Torrance) is on active service, we cannot get round quite so often. We also visit any farm outside the city—in Derbyshire or the West Riding—which we may have proved is sending tuberculous milk into Sheffield, and examine the cows. We have power to do this under the Sheffield Corporation Act of 1900.

When examining a cow's udder, I like to have it "milked out." I usually observe and manipulate the udder in the particular state it may be in when I arrive in the cowshed, because one may learn something from that. But before proceeding to a really serious examination of the udder, it is essential that it should be empty. It is surprising what varieties one encounters, even among healthy udders. Some variety of course we expect to find, as, for instance, the small, neat, compact udder of the heifer, which almost disappears when the milk is drawn; the larger, but usually compact udder of the second calf cow, etc.; but when we come to the third calf cows and upwards, we great a great range of variation:—

(1) The square, well-balanced, not too large udder of soft texture, which milks down "like a bit of silk," as the farmers often say.

(2) The fairly well-balanced udder which does not milk down quite so well—which is more fibrous.

(3) The udder which, while apparently and even demonstrably free from disease, is uneven in its quarters. The irregularity may take any form; hind quarters may be out of all proportion to the fore quarters, one hind quarter may be larger than its fellow, etc.

(4) The pendulous udder.

(5) The extremely fleshy udder, which hardly alters in appearance when milked out.

(6) The udders which have blind quarters from the commencement of lactation.

(7) The udder of the newly-calved cow which is in a state of physiological congestion, or "hogged," as the farmers in these parts call it.

(8) The udders of cows nearly dry, which are shrunken and often nodular from contraction.

In examining the udder, as I remarked before, one should first observe it and manipulate it when full of milk, and so get some idea of the character of the udder, and be better prepared for the proper examination when the udder is empty. When milked out, the udder should be observed again, especially from behind, The eye may detect some irregularity at once, perhaps in the relative size of the quarters. Next proceed to manipulation. This should tell us a good deal as to whether the udder is normal: if abnormal, the nature of the abnormality—whether affecting one or more quarters; if a swelling, whether slight or considerable, hard or just fleshy; whether heat or pain are present; whether diffused or localised, high up or low down, smooth or nodular, etc. The next step is to draw some of the milk from the affected quarter, either into the hollow of the hand or into a glass vessel or bottle. We should gather some fresh information from this. By this time we will probably have begun to form some opinion as to the class of mastitis we have discovered, and a little judicious questioning of the cowman or owner *may* bring something to light which will either confirm us in our opinion, or cause us to reconsider it. It frequently happens that well-marked cases of acute or even chronic mastitis are, according to the cowman, "just a bit of a cold," "been lying opposite the door," or again, "the cow always lies on that side," or perhaps, "the lad doesn't strip her properly." Sometimes these explanations may fit the case, and we may be satisfied. In other cases, alas! the cowman either wants to deceive us, or, perhaps, his powers of observation are not well developed. I shall pass on now to a brief consideration of some of the common forms of mastitis.

It is not altogether easy to decide what classification to adopt in regard to diseases of the udder. Some observers speak of a streptococcal and staphylococcal mastitis; others, whilst mentioning forms of mastitis complicated by infection with these organisms, do not regard them as specific. For my part, I rather like the classification given in Smith's "Veterinary Hygiene," and I have more or less adopted it.

Interstitial Mastitis — which is often referred to as cold. This condition is very commonly met with, it is characterised by considerable swelling of one or more quarters, accompanied by a good deal of heat and pain —often the cow will not permit the quarter to be handled—the swelling usually comes on very suddenly and lasts generally not much longer than a week. It is really an acute inflammation of the subcutaneous and interstitial tissues, and is probably the result of skin infection through some trivial and perhaps unnoticed wound. In this form of mastitis the milk is scarcely altered in character, unless it be a little more watery, and the quantity may be diminished. The condition cannot easily be mistaken for tubercular mastitis. The presence of marked heat and pain, the practically normal appearance of the milk in the presence of so much inflammation and swelling and, where reliable, the history, should enable us to recognise its nature.

Catarrhal Mastitis. This condition is not so commonly met with, and does not give rise to such marked objective symptoms as the last named. It is generally confined to one quarter, and consists of an inflammation of the lining membrane of the milk sinus and sometimes of the ducts. On manipulation, one finds a hardening in the lower part of the udder at the base of the teat, and around the sinus, but not accompanied by any degree of pain or acute symptoms, while the affected quarter presents no marked enlargement. The disease runs a slow course, and it is some time before the milk regains its normal condition. Even for a time after recovery some thickening and induration remains in the lower part of the udder. While this condition is probably due to infection by organisms of low virulence, Malcolm, whose description I have almost literally followed, tells us that dairymen have no doubt that it is less frequent with careful milkers than with careless and incompetent milkers. In this condition, the milk at first shows no apparent change, but, if allowed to stand until the cream separates, it looks watery—almost translucent, while with the cream appears to be a mucoid material. Later on it may contain clots. This disease can usually be distinguished from tubercular mastitis by the position of the induration, the slight alteration of the udder and the character of the milk.

Acute Parenchymatous Mastitis is an acute inflammation of one or more quarters of the udder. Considerable swelling is always present and is accompanied by varying degrees of heat and pain. On manipulation, the affected quarter is found to be hard, and is often so tense as to feel as though it were on the point of giving way. Constitutional disturbance usually exists and may be very serious, depending upon the degree of severity of the disease. Suppuration soon follows the occurrence of the disease, and may bring about a very gross alteration in the udder. The swelling and pain may be so intense as to interfere with the movement of the corresponding hind leg and cause lameness. A common sequel is complete loss of the quarter with subsequent atrophy—though sometimes a marked nodular induration may persist for a long time. In the early stages, the milk is curdled and diminished in quantity; later it becomes yellowish-brown from admixture of pus, or it may be reddish from presence of of blood. As the disease progresses, the secretion gets thicker and thicker, until it can only with great difficulty be drawn from the teat. In most cases microscopical examination shows pus cells and large numbers of staphylococci or streptococci. This condition in some stages might, at first sight or on the first manipulation, be mistaken for tubercular mastitis, from the marked enlargement and induration which is present. A closer examination, however, will enable one to differentiate them. In the acute stage, the presence of marked heat and pain, the great thickening of the secretion and, probably, abscess formation. In the later or chronic stage, atrophy, with total or partial loss of the quarter, should satisfy us as to the nature of the disease.

Traumatic Mastitis. This condition is fairly common, especially in cows with large udders. It somewhat resembles interstitial mastitis—the so-called "cold." It usually affects one quarter of the udder, and manifests itself by considerable swelling with varying degrees of heat and pain. It comes on suddenly, and if the structure of the udder is not damaged, it subsides fairly soon, with no alteration of the milk and no noticeable affect upon the udder. If the injury be severe, there may be blood in the milk and the secretion may diminish. If a wound is present, infection may follow with possible abscess formation. In the case of

this disease also, the symptoms and the character of the milk should serve to differentiate it from tubercular mastitis.

Tubercular mastitis. In approaching a consideration of the symptoms of this disease, I would like to say at the outset that in my opinion one must not be dogmatic as to what constitutes the absolutely typical clinical symptoms of tubercular mastitis. It is largely—perhaps chiefly—a matter of practice in examining cows' udders. A great deal depends upon the stage of the disease which we encounter. Some tuberculous udders are apparent, some are only found by a very careful examination, others—even when we know that one exists in herd—can only be found by a process of elimination.

Tubercular mastitis involves one or more quarters of the udder—most commonly one quarter only, generally a posterior one, and, strangely enough, more frequently the right one. As in the case of most forms of mastitis there is, at some stage, a swelling or enlargement of the affected quarter or quarters. In the early stages this may not be very apparent: we may be able to detect only a small swelling or hard place in the substance of the gland. Most of the forms of mastitis we have considered start in a fairly acute way, run a short and sharp course, and end in either complete resolution, or in the loss of function of the part with atrophy. Tubercular mastitis, on the other hand, almost always starts in a small and inconspicuous way and goes on increasing—the last stage is always worse than the early or intermediate stage. As we have said, the disease starts with a small swelling, usually high up in the quarter or quarters, and gradually increases until the whole quarter or even the whole udder is affected.

I may say here that I have come across a good many different manifestations of the disease myself. I have found small indurations, indurations involving half the quarter, the whole of a quarter, marked swelling of a whole quarter, of a fleshy character—not really indurated, and in a very few acute cases, usually following on calving, the whole udder has rapidly increased until it was an enormous size. In spite of this, however, one may say that the essential features of tubercular mastitis are a gradual increasing induration of a quarter or quarters. There is little or no pain, no heat, and the condition may last for weeks or even months, the quarter getting bigger and bigger and harder and harder. Great hardness is an important feature, and usually extends in advanced cases right up to the very top of the udder. In emaciated cows, the supra-mammary gland of the affected quarter can often be felt on manipulation, and found to be much increased in size, and hard. In the early stages the milk is not noticeably altered in appearance, but very soon, if it be drawn into a glass vessel or bottle, it will often be seen to contain very small flecks or flocculi, which deposit or spray on to the sides of the vessel and remain there like particles of white powder. Later, the milk diminishes in quantity, becomes watery and contains flocculi of a larger size. On being allowed to stand, a deposit will be seen at the bottom of the bottle consisting of small, well-separated white particles. In later stages it becomes brownish in colour, and in old-standing cases it may look like cloudy beer. It rarely or never becomes thick and curdled, but throws down a granular deposit.

Although I have attempted to differentiate between the commoner forms of mastitis, and whilst I consider that in general differentiation is not difficult, one must not forget that a mastitis may be found which results from, or is the seat of a "mixed infection," which somewhat complicates matters. Thus, streptococci or staphylococci, or both, may be present along with tubercle bacilli in a particular case of mastitis. In such cases a microscopic examination of the centrifuged deposit from the milk of the suspected quarter may only reveal the presence of cocci and pus cells, whereas the biological test will show that the sample is tuberculous. We have had several such cases in Sheffield this year.

I may say here that, when taking a sample of milk for bacteriological examination for the presence of tubercle bacilli—particularly when I intend to make a microscopic—I prefer whenever possible to obtain the strippings, as I am of opinion that they are likely to contain more bacilli than the earlier drawn milk. A portion of the sample thus obtained I centrifuge for 15 or 20 minutes. In an average case, when tuberculous, there is generally a fair deposit—not a heavy one—of a whitish-grey somewhat slimy-looking material. I make as thin a smear as possible with this, stain with carbol fuchsin, counterstain with methylene blue, etc. If the sample is tuberculous, I have little difficulty in finding acid-fast bacilli, and when that happens, have no hesitation in recommending the slaughter of the cow. The presence of acid-fast bacilli in milk drawn from an udder exhibiting the clinical symptoms I have already mentioned justifies the assumption that the milk is tuberculous.

Earlier in my paper, I said that I hoped to show you by means of figures that it was to the advantage of Local Authorities to employ Veterinary Surgeons as Inspectors of Dairy Cattle. As I perhaps have made my paper somewhat lengthy, I will give just a few figures.

From the 20th April, 1913, to 20th April, 1915, a period of two years, 204 samples of milk were taken by the Corporation veterinary staff of this City from abnormal udders—more or less suspicious of tuberculosis. Eighty-four of these samples proved to be tuberculous—either by the biological or microscopic examination—that means that 41.1 % of the samples taken were tuberculous.

During the same period, 83 control samples were taken as a check on our inspection, when sampling special udders. Seventy-five of these control samples proved to be non-tuberculous. Eight samples proved to be tuberculous. In other words 90.5 % of these samples were negative, whereas 9.5 % only were positive.

It often happens when one visits a farm where the milk has been found to be tuberculous, that one fails to find any udder which is outstandingly suggestive of tuberculosis, although one may find several udders which show some degree of induration, all more or less of a similar character. Further, the general health and condition of the cows may be so uniformly good that one is unable to select any particular cow as the possible culprit on the strength of constitutional symptoms, with or without noticeable udder lesions. In such cases it may be thought necessary to sample several cows, more or less as an experiment. In this way more special samples may be taken than are strictly warranted, and so the percentage of non-tuberculous special samples is apt to turn out high, with a consequent lowering of the percentage of tuberculous special samples.

I trust, Mr. President and Gentlemen, that my paper may have been of some interest to the members of the Association, and I hope that it may serve to provoke a discussion on the subject, if not to-night, perhaps on some other occasion.

The members then adjourned for tea.

The PRESIDENT, upon re-assembling, said: I am sure we have all heard Mr. Morgan's paper with a great deal of pleasure, and as Mr. Lewis has not much time in which to catch his train I will ask him to open the discussion.

Mr. H. P. LEWIS: It is very kind of you, Mr. President, to give me the honour of opening the discussion. I must first of all congratulate Mr. Morgan on his very excellent paper and endorse what he has said, especially with regard to the employment of veterinary surgeons for examining cows. I may just relate one instance that occurred whilst I was in Sheffield, where a lay Inspecter

was examining cows in the West Riding. He examined a herd of eight cows, and reported to the Medical Officer of Health that five of them had tuberculous udders. Subsequent veterinary examinations and the application of the biological test proved that none of the cows had tubercular disease of the udder.

The examination of cows for tuberculosis of the udder is a very difficult problem at times. Where the lesions are well marked there is little difficulty, and when aided by microscopic examination it is easy to decide; but there are cases where it is impossible to say whether it is tubercle or not. I find it is impossible to lay down any hard and fast rule with regard to lesions or symptoms presented by this particular disease. A case I would like to illustrate is one I came across in Sheffield, and which impressed me very much. I had been through the herd and could only find one cow that exhibited symptoms which were at all like tuberculosis. There was another cow which appeared to have a commencing garget, and symptoms which tended to put me off the cow for the time being, both hind-quarters equally affected, increased heat and tenderness. I saw the lady at the farm and told her the cow was suspicious. She said she did not believe it, and said that, as a matter of fact, it was their best cow, that they used the milk themselves, and that the animal was what they called their "butter cow." She said "we feed the babies on its milk." I took a sample and found it teeming with tubercle bacilli.

With regard to the examination of milk—I differ from Mr. Morgan in this way. I am not particularly in favour of centrifuging the milk. I know I am almost alone in that respect, because it is believed to be the correct method, but I hold the opinion that tubercle bacilli in milk can be detected much more often without centrifuging than with it, for this reason: there is a deposit in the milk if it is allowed to stand for a short time. By taking that deposit and using it alone you have on the slide the matter containing the tubercle bacilli themselves without any contamination. If you centrifuge you throw down many of the other heavier particles of the milk—dirt and other stuff, consequently the possibilities of finding the bacilli are diminished, because taking only a small portion of the deposit you may get a sufficient portion on the slide without having any tubercle bacilli. If you collect sufficient of the material on the slide until you have a few specks you get better results than by centrifuging the milk, because you know the particles you put on the slide contain the tubercle bacillus if it is present in the milk. That is one reason why I favour the examination of milk without centrifuging it.

The symptoms which are presented of inflammatory changes of the udder which simulate tubercular mastitis have been very fully described by Mr. Morgan.

Mr. F. L. Somerset: My experience in examination of udders for tubercular mastitis is of course very small compared with that of the gentleman who has read the paper. I think Mr. Morgan is correct in saying that you cannot describe any condition of the udder as specific as indicating tubercular infection. You may have very grave suspicions, but there is no lesion of the udder which, by ordinary palpation and examination of the udder, you can describe as certainly indicative of tubercle. Mr. Morgan said that his experience was that the lesions in tubercular mastitis were not gross lesions. I have seen a case in which the product of the udder was absolutely swarming in bacilli. I never saw such a quantity in my life, and the case from all appearances on examination might have been an ordinary case of garget. The whole udder was affected. There was a certain amount of heat, it was not nodulated, it was a general enlargement of the whole udder, and I merely suggested to the owner that it would be advisable to have it examined microscopically. I examined it and found it was a very bad case. The beast was slaughtered, and there was tubercle practically all over the body.

A local authority took a sample of mixed milk from a dairy and found acid-fast bacilli. The inspector came along and found a case. A sample was taken from this particular beast. They applied the biological test and they condemned the beast on that. As inspector to the second local authority I examined the beast very carefully, and I could find no induration or nodulation, or any abnormal sign. I took a sample of the milk and examined it and could find no acid-fast bacilli. I took a large number of samples from this beast and could still find no acid-fast bacilli. Consequently I sent a sample up to Derby, and it was examined by a much cleverer microscopist than I, but he could find nothing. A guinea-pig was inoculated and it was reported that the biological test was positive. The owner was so positive that there was no tubercle that he would not accept compensation when the beast was condemned. He said he would have the beast slaughtered and get more money for it than we would give him. He had it slaughtered, and to my astonishment the carcase was badly affected. For this reason I am of opinion that the microscopic test is not to be relied on. There is no difficulty in getting a proper result from the biological test, but from the microscopical test you may not get a positive result. I quite agree with Mr. Morgan as to hind quarters being most usually affected, also more often the right one, and I should like to know if he has any reason for that phenomenon. As to the rest of his statements I may say that my experience is on the same lines as his.

Mr. T. C. Fletcher: Perhaps no one in the district has more intimate connection with the examination of udders than I, in both being asked to advise owners as to the condition of cows' bags before they let Mr. Lloyd or Mr. Morgan see them, and I may say that I find there is an enormous difficulty in giving advice sometimes, but I always find it is as well to err on the side of safety, because the visits of inspectors to farms used to be fairly regular and fairly constant, now owing to the upset in the office at the Town Hall as regards the veterinary inspectors, their visits to odd farms are sometimes few and far between. In advising clients as to the probability of animals having tuberculosis of the udder, I always safeguard myself by the nodular condition, and it is the only condition about which we as veterinary surgeons—barring the guinea-pig test—can speak with any certainty. In some cases the nodules are very small, and you have to take the substance of the bag and rub, and a very fine touch is wanted in some cases to detect it. If the udders are hard and do not exhibit this condition I do not take much notice of them, because those practitioners who see a lot of mastitis or garget, or affections of the teat that produce mastitis, know that the hardened condition of the bag is very common following it.

I should like to ask Mr. Morgan in what percentage of cows' udders he noticed tubercle bacilli produced in a case of garget. I know owners in this district are very much incensed against inspectors taking samples, because they take samples from the quarter of the bag that is in an inflamed state and is holding pus and other inflammatory discharges, and they hold that an inspector has no right to take a sample from a bag in that condition. It seems absurd that he should do so, but at the same time events have proved that they have been justified in doing it, if simply because they have to show some reason for inspection. They cannot depend upon their guinea-pig test because the conditions of the bag are such that the pig often dies before the time required for the production of tubercle in that animal has expired.

I thank Mr. Morgan for his very excellent paper, and to us that are mixed up with dairy cattle practice it has been one that has given us much pleasure to listen to.

There is one disease which has not been touched upon, and that is the condition of a scab-end of a cow's teat which is commonly called "crushed teat." Those who are in general practice know they are difficult cases to deal with. If you start to use a milk tube to counteract that particular condition it produces mastitis. The only treatment I have found to avail is to let the milk stop in the bag until the farmer has time to foment and apply antiseptic dressings to counteract the inflammation. There is an old dodge—the wax match treatment. They knock off the head of the match, wrap the match in silk and insert it to keep the duct open. I should like to hear Mr. Morgan's experience of that in producing mastitis in any form.

I think there is no true test for tubercular mastitis except the guinea-pig test. If the milk is teeming with tubercle bacilli I should always condemn a cow on the strength of an expert's advice; still if there is no tubercle bacilli I should not say there was no tuberculosis of the udder unless I had gone as far as the guinea-pig test.

Mr. S. E. SAMPSON: I have very much appreciated Mr. Morgan's paper on a subject that is closely connected with those who are engaged in country practices, and one that will be even more so as time goes on. Whilst speaking of that, I would like to issue what might be called a word of warning with regard to farmers who ask to have the whole of their cows examined periodically by a private practitioner, and the warning is the difficulty one has of distinguishing without any bacteriological examination, a tuberculous udder at the commencement. I feel certain we pass over, and the inspectors pass over, dozens of cases of tuberculous udders where they pay periodical visits to the dairies. When one is asked to examine a herd of cattle and give an opinion as to tuberculosis, I think it is a job that should be taken on with the greatest care and temerity.

I think in the future we may be asked by the small local authorities what steps they should take when the new Bill comes into force. I think we ought to consider whether we shall be justified in advising them to be satisfied with a clinical examination, or whether we shall advise them to go so far as to have the milk tested bacteriologically at fixed periods.

I should like to ask what percentage of acid-fast bacilli are found by the microscopic test. I enquired when I was at Derby and the Medical Officer was unable to give any reply.

There is also the matter Mr. Fletcher spoke of, the question of the sore teat, commonly called "pip garget." At one farm where they used to milk fifty or sixty cows they were always getting it. The farm changed hands, a milking machine was bought, and since then we have not had a single case. I find the best treatment is not to use a wax match, but the teat tubes. I have had fairly good results, that is to say I have not had the troublesome cases I used to get.

Mr. F. L. SOMERSET said: I have had a few cases of scabby teats recently. I have used the milk syphon, with an instruction to the owner that the syphon should be boiled every time. I have had no mastitis.

Mr. J. S. LLOYD said: As the original sinner in this case I suppose I ought to say something. Mr. Lloyd then drew attention to certain figures given in his annual report as chief veterinary inspector for the City of Sheffield. He said, "The first thing I wish to draw your attention to is the percentage of tuberculous milks, and the percentage of tuberculous udders. The table practically covers all that has taken place since I was first appointed in Sheffield. The figures show that the percentage of tuberculous mixed milks is gradually declining. The same thing took place in Manchester, and it gradually went down to 6 per cent. about four years ago, and since then it has been gradually rising. I think that when we get a small percentage like 5.3 of positive control samples, our friend Mr. Sampson is unwarranted in saying that we pass a lot of cows with tuberculous udders.

In regard to cows with suspicious udders, the percentages have varied very considerably. In 1906, that is the last year I examined the cows in Sheffield myself, the percentage of tuberculous udders to the samples taken was 64.7. In the next year they went down to 27.4, but then the assistant veterinary inspector was instructed to take a sample from every abnormal udder showing the slightest suspicion of tubercle

There is just one other matter, that is the percentage of tuberculous udders in the country generally. It has been publicly stated that two per cent. of the dairy cattle in this country are suffering from tuberculosis of the udder. I defy anyone to prove that. The late James King, of Islington Cattle Market, examined the udders of 100 consecutive cows, and two of them turned out to be tuberculous. Our figures in Sheffield do not support that. I do not think there is one per cent.

There is occasionally great difficulty in diagnosis. Our friend Mr. Lewis would have borne me out. He had to go to a farm four times to find a cow with a tuberculous udder. Mr. Young and myself went to another farm twice each to find a cow with a tuberculous udder, and the cow with the tuberculous udder was the first cow we examined each time we were there.

That brings us to Mr. Morgan's remark: "Do not believe the owner's history of the case." The udder, as in this case, may have been rubbed with all sorts of liniments. You may examine the cow, but you will not be examining the udder, you will only be examining the skin of it, and the condition caused by the liniment will mislead you.

The feeling of the cow's udder. My way of examining a cow with a tuberculous udder is this:—I feel the udder and it is hard, it may be nodulated, and the nodules may be large or small, or you find an indurated mass, which again may be large or small, and the skin is always free from it. If in such a case you find there is no pain on pressure, I think you are justified in deciding it is a case of tuberculosis.

One condition I have found that has led me astray. The subject was an Alderney cow. When we killed the cow all she had got was a cold abscess, and she had not tuberculosis of the udder. The abscesses had all become inspissated into a kind of hard mass.

If you get clinical evidence of tuberculosis of the udder, *plus* the presence of acid-fast bacilli in the secretion from the udder, you are justified in saying that the cow has tuberculosis of the udder. I have only known one case that was different, which occurred whilst I was in Manchester. I went to a farm and found a cow that I thought was tuberculous. I sent a sample of the milk to the University, and one of the assistants reported that the sample was positive. At that time Professor Delépine was carrying on a series of experiments. He wanted to get samples of milk from known tuberculous cows every other day to see if there were acid-fast bacilli present every time. I arranged to take the necessary samples, and in doing so found that the udder, instead of getting worse, was gradually recovering. The cow was ultimately killed. The carcase was examined by several gentlemen, and no trace of tuberculosis could be found. Professor Delépine said that it was probable that his assistant had made a mistake in the first instance.

There is a matter that I think we ought to discuss, and that is the question of administration. The question is going to come up. In connection with the new Milk and Dairies Act which comes into operation on October 1st, 1915, there is going to be a set of model

regulations drawn up jointly by the Local Government Board and the Board of Agriculture, and one of the things that is going to be in those regulations is periodic inspection of all dairy cattle. If the administration is going to be left in the hands of the Medical Officer of Health he is practically going to administer the Tuberculosis Order, with which he has nothing whatever to do, and if we are to keep the administration in our hands whole-time veterinary officers for Counties and County Boroughs will have to be appointed. Under the Milk Bill the Medical Officer of Health takes a sample of milk, and as soon as he finds it to be tuberculous he arranges with the Medical Officer of Health of the district from which the milk has come for the cows to be examined. Under the new Act the cows have to be examined by a veterinary surgeon, who, if he is the Veterinary Inspector under the Diseases of Animals Acts, will deal with the cow in accordance with the Tuberculosis Order.

Mr. LEWIS drew a difference between centrifuging and sedimentation. It all comes to the same thing in time. If you centrifuge for 15 minutes you get a sedimentation, and if the sample has been taken carefully there should not be much dirt.

There is a method which Prof. Delépine used in regard to milk which has never been carried out in Sheffield. I believe he centrifuges all the "mixed" samples and takes films from them on cover glasses. He puts the cover glasses in an ether bath, and then into a sand bath. In this way he gets rid of the milk fat, and I am informed his results show a considerable percentage of tuberculous mixed milks without referring to the guinea-pigs.

There is this to be said about Mr. Morgan's methods—he has been very successful in finding tubercle bacilli. If you get a case with clinical symptoms of tuberculosis of the udder and you get acid-fast bacilli in the secretion, you are justified in concluding that the animal is suffering from tuberculosis of the udder, and the result is you keep the matter in the hands of the veterinary surgeon, and the case is also dealt with expeditiously.

Mr. S. E. SAMPSON asked if it was the custom in Sheffield to examine the milk of the cows in the city cowsheds or only the udders.

Mr. LLOYD in reply quoted figures given in his annual report, and said that it was customary to examine the milk as well as the udders.

REPLY.

Mr. A. D. MORGAN said: Mr. Lewis said that when making a microscopic examination, he preferred to obtain his deposit by allowing the milk to stand for a short time rather than by centrifuging, as by the latter method the deposit contained so much dirt and *débris* that it made the discovery of acid-fast bacilli difficult. Personally, I cannot see it, and never could. Naturally, a great deal depends on the heaviness of the infection—some milks are so bad that one has only to dip in the platinum needle to obtain plenty of bacilli. I take it that the object of centrifuging is to concentrate or aggregate the particles in the milk which consist of dirt, epithelial cells and bacteria. I have tried the depositing method, and my difficulty was to secure the few flocculi which came to the bottom of the bottle. If one tries to pour off the milk, very often one also pours out the flocculi, whereas, in centrifuging, the deposit is flung to the bottom of the tube and sticks there—it has to be persuaded to come off—it won't pour out. However, it is a matter of opinion.

Mr. Somerset said that sometimes he had failed to find acid-fast bacilli microscopically, and yet, when the samples have gone through the biological test, they have proved to be tuberculous. That is of course quite possible—indeed it often happens. Here again it depends largely on the heaviness of the infection, and also to the time one gives to the examination. I have often spent three hours looking at a slide and found only three or four bacilli at the end of that time; but, when I find even that small number I am satisfied. But one may fail to find them, and that is not really surprising. It is quite conceivable that a particular sample of milk might only contain say ten acid-fasts, and one may easily fail to find one of them by microscopic examination, but the guinea-pigs will almost certainly find them.

Mr. Fletcher spoke about nodular induration being almost diagnostic of tubercular mastitis. Certainly it is an important feature, but it is not sufficient by itself. I find that following on a garget there is often a very marked nodular induration, although in these cases there is often contraction. The character of the secretion is important. Mr. Fletcher remarked that farmers objected to us sampling the milk in cases of acute mastitis and that such a proceeding seemed needless; yet, in some cases, subsequent results had shown that we were justified in sampling. As a matter of fact, we seldom sample in acute conditions.

I have stated in my paper that one may encounter a "mixed infection," but I did not mean that we should sample all these gross cases on the chance of them being tuberculous. Personally, I give such cases the "go-by." If I come across a case which appears to be a garget, where the milk may be yellowish or brown but not much curdled, I might sample—even although fairly acute symptoms might be present. I consider that the general condition of the cow is something to go by. It may not be strong evidence, but it is often some guide. In regard to the risk of taking cows on the evidence of the microscope, I cannot recall a single case during the two years I have been in Sheffield when we have acted in that way which has not been amply confirmed by the post-mortem examination. I can, however, recall a case where the biological test of the milk was positive, and yet, on post-mortem, we were unable to find any microscopic lesions.

Mr. Sampson spoke as to the difficulty of finding tuberculosis of the udder, and suggested that we miss a good many among the city cows. I may say that we examine very carefully, if possible when the udders are empty, and frequently supplement that by taking a control sample from the whole herd, so that I think we get the bulk of the cases.

In regard to the number of special samples taken in Sheffield in some years. Mr. Lloyd has said that certain of his assistants, when they first came, through lack of experience had taken more samples than they need have done. For myself, whilst certainly I had not had much experience in examining cows' udders when I first came here, at least I was used to them, for, before taking up veterinary studies, I had had some five years experience of farming. Three years of that period I had spent on a large dairy farm in North Wales, where we milked something like 50 cows, I myself milking anything from ten to a dozen regularly morning and evening all the time I was there, so that I had some acquaintance with the commoner forms of udder disease, though I don't suggest that I learnt anything about tuberculous udders.

Mr. G. J. FURNESS proposed that a hearty vote of thanks be given to Mr. Morgan for his paper. He said: "I should like to refer to a case where I had to follow the Sheffield Veterinary Inspectors. They had paid two or three visits to the farm. I think they had been bested, and could not find the affected cow. I got instructions from Derby to take a sample from each cow, and they spotted it. On the report from Derby we slaughtered, after a good deal of discussion as to whether we should or not, and the post-mortem revealed tuber-

culosis of the peritoneum, and there was very slight tuberculosis of one quarter. The growth was very small, but the carcase was badly affected in the peritoneum. I am quite pleased to have been here to listen to Mr. Morgan's excellent paper, and I am sure we have all been very interested.

The PRESIDENT seconded, and the vote of thanks was carried with applause.

Russia as a future cattle buyer.

A correspondent to the *Live Stock Journal* writes:—"I saw in a recent issue of *Hoard's Dairyman* an article by Mr. J. J. Dunne, Denmark, the celebrated breeder of Holstein cattle, describing the work done during the past year by the Cow Testing Association on the Island of Funnen. One of the matters undertaken by the association was a petition to the Danish Department of Agriculture to send an efficient agent to Russia in order to investigate the possibility of improving the existing trade in pedigree stock with Russia.

In the same issue of the paper there is an article describing the Russian butter industry in the provinces of Tobalsk and Tomsk, in Western Siberia, which sprang up as soon as the country was opened up by the Trans-Siberian Railway. In the year 1906 there were in Western Siberia 526 co-operative societies with 37,000 members, owing 182,000 cows, and exporting 6,000,000 lb. of butter annually; in 1912 there were 1500 societies, having a membership of 120,000 and exporting 180,000,000 lb. of butter."

ARMY VETERINARY SERVICE

Extract from *London Gazette*,

WAR OFFICE, WHITEHALL, May 7.

REGULAR FORCES. ARMY VETERINARY CORPS.

To be temp. Lieutenant:—W. Barr. Dated March 8.

May 8.

To be temporary Lieutenants:—

D. Campbell. Dated April 20.

C. J. S. Macara-Finnie. Dated April 25.

Personal.

BROADHURST.—On April 15, at Crantock, Sudbury, Suffolk, the wife of O. S. Broadhurst, M.R.C.V.S., of a son.

Mr. WILLIAM FERGUSON, M.R.C.V.S., Dundee, has been appointed veterinary inspector for the East Carse District by the Executive Committee of Perth County Council, in succession to Mr. J. Park Hamilton, who has resigned.

John Harper, a herdsman, who in the employment of Dr. Clement Stephenson earned much renown for his employer and himself, died recently. In 1871 Harper won his first championship, at London's Smithfield Show, with an Aberdeen-Angus steer shown by Mr. J. Bruce, Burnside. After that period came a number of national successes gained on behalf of Dr. Stephenson's herd.

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.		Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange. ‡		Sheep Scab.	Swine Fever.	
		Outbreaks (a)	Animals.	Outbreaks (a)	Animals.	Outbreaks (b)	Animals.	Outbreaks (b)	Animals.	(b)	Outbreaks (a)	Slaughtered. *
GT. BRITAIN. Week ended May 8		15	16					29	60	4	98	466
Corresponding week in	1914 ...	19	20			1	1	34	56	1	108	1246
	1913 ...	9	13			3	4	55	109	2	78	1797
	1912 ...	18	19			5	5	33	85	3	69	1038
Total for 19 weeks, 1915		300	333			11	16	‡249	‡584	148	1490	6555
Corresponding period in	1914 ...	356	380	11	74	35	81	1173	2111	140	1380	14094
	1913 ...	251	273			64	208	1350	2802	114	826	11895
	1912 ...	424	475			65	141	1848	4152	159	1262	16055

‡ The Parasitic Mange Order of 1911 was suspended from 6th August, 1914, to 27th March, 1915, inclusive.

(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked:

Board of Agriculture and Fisheries, May 11, 1915 ‡ Figures for three weeks only.

IRELAND. Week ended May 8		...	...	...	...	...	...	Outbreaks ...	8	6	33
Corresponding Week in	1914 ...	1	1	...	...	...	...	1	4	6	18
	1913 ...	...	...	...	...	...	...	2	13	3	70
	1912 ...	...	...	...	...	...	...	3	4	8	114
Total for 19 weeks, 1915 ...		1	1	...	...	1	3	17	226	108	659
Corresponding period in	1914 ...	1	1	70	890	...	...	40	322	98	443
	1913 ...	...	...	...	...	...	...	82	267	61	378
	1912 ...	1	1	...	...	...	...	37	247	98	928

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, May 10, 1915

NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection